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Starting in February 1961, the Midwest Program on Airborne Television Instruction (MPATI) transmitted courses in foreign languages, science, arithmetic, art, the humanities, music, social studies, and international relations to eighteen schools in the Midwest. The airborne telecast operated over north central Indiana and transmitted courses over an area 150 to 200 miles in radius encompassing parts of the six States of Illinois, Indiana, Kentucky, Michigan, Ohio, and Wisconsin. Area coordinators and committees consisting of school and university educators and administrators, educational television representatives, and lay leaders provide liaison between MPATI and colleges and school participating in the program. Selected television teachers prepare the courses for airborne television; the recording work is completed at designated educational television stations.

A section on special information for schools gives advice about the type of equipment necessary, equipment and room costs, and how to participate in the program. A roster of the participants in the planning and development of MPATI is included.

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583

ED002238

DONALD G. PERRIN

c/o Cinema Department
University of Southern California
Los Angeles 7, Calif.

583

MIDWEST PROGRAM ON AIRBORNE TELEVISION INSTRUCTION

–a regional exploration in education

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INSTRUCTIONAL TECHNOLOGY - U.S.C.

Here is an exciting new adventure in education. An increase in educational quality and economic efficiency are prime goals. Airborne television to assist classroom teachers, and the evolution of a system of local-state cooperation for permanent management of the regional program, are the prime means. Rigorous evaluation of the educational, economic and management prospects will be incorporated into local, state and regional discussion and action.

JOHN E. IVEY, JR.

DONALD O. PERRIN

MPATI

HIGHLIGHTS

PURPOSES:

1 To broaden the range of educational offerings available to many schools.

2 To increase the quality of offerings in schools and colleges where resources are unavailable or inadequate at present.

3 To do these at a cost that is less than that for a comparable increase in quality achieved by other means.

4 To conduct the initial program in a manner that will assist the development of a permanent facility for the long range management and financing of the airborne instructional program by local and state educational authorities.

MEANS:

Educational courses on video tape will be telecast from an airplane flying at high altitude over north-central Indiana. The telecasts will be received on TV sets in classrooms of participating schools throughout the telecasting area.

TARGET AREA:

Telecasts will cover a circular area 150 to 200 miles in radius and encompassing parts of six states: Illinois, Indiana, Kentucky, Michigan, Ohio and Wisconsin.

SCHEDULE:

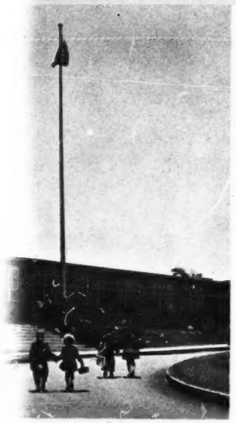
Demonstration telecasts will start in February, 1961. First full academic year of telecasting will start in September, 1961 and continue until June, 1962.

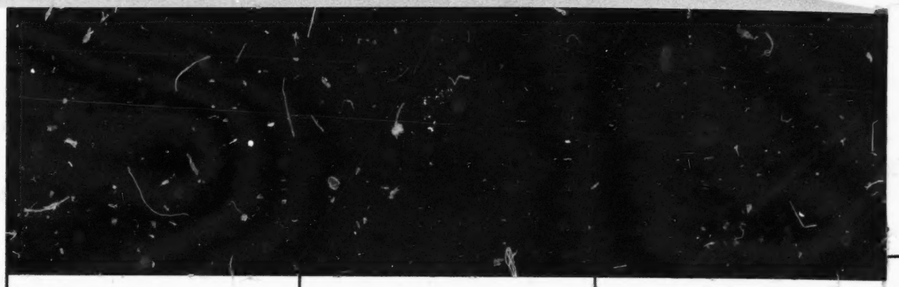
SCOPE:

During the full academic year, courses will be telecast on two channels six hours a day, four days a week. This amounts to 48 hours a week of telecast courses.

FINANCIAL SUPPORT:

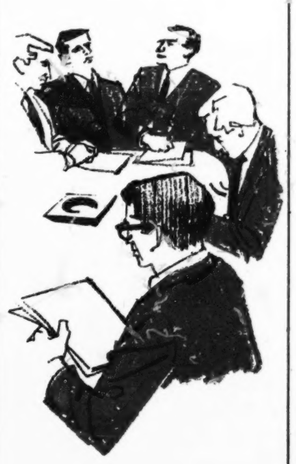
Total project costs of $7 million are being met by a $4½ million appropriation from the Ford Foundation and contributions by private industry.





SPRING 1960

Area Committees established. Program of studies determined. TV teachers selected. Schools and colleges indicate interest in participation. Schools receive tentative schedule of telecasts.



SUMMER 1960

In-service workshops conducted at Area Resource Institutions for classroom teachers, principals and superintendents.

Workshops at Purdue University for preparation of courses by TV teachers, curriculum specialists, subject matter authorities, TV producers, and graphic art consultants.

DECEMBER 1960-JANUARY 1961

Airborne test patterns for receiver installations.

SCHEDULE OF OPERATIONS

FEBRUARY 1961-JUNE 1961

Demonstration telecasts from the aircraft.

SUMMER 1961

In-service workshops conducted at Area Resource Institutions for classroom teachers, principals and superintendents.

SEPTEMBER 1961-JUNE 1962

Full academic year of telecasts.

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- Feasibility demonstrated

b The program's potential

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- Tentative schedule of courses
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- Equipment considerations
- How schools and colleges can participate
- Alternative installations
- Sample equipment costs
- Cost per room equipped
- Financing
- Some questions and answers

e Roster of participants in planning and development
- MPATI staff

WHY EDUCATION BY AIRBORNE TELEVISION?

a

The nation's schools and colleges face the dual challenge in the coming years of educating far more students and giving each student a much better quality education than ever before.

Educational expenditures will have to increase, but it takes more than money to solve the problems posed by this challenge. It requires important innovations that will increase instructional effectiveness and improve the relevance and quality of the curriculum.

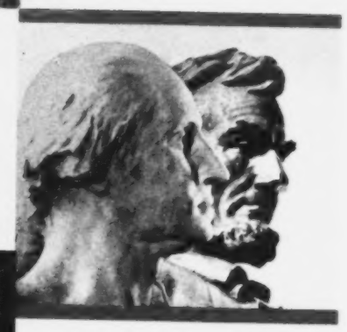
Only a fundamental breakthrough in education, as sweeping as past breakthroughs in science, industry and agriculture, can provide the boost in educational quality that is needed, all across the curriculum and all across the country at a cost that can be met.

Television represents one powerful new tool which can help schools and colleges develop these innovations. Like movable type and the printed page, however, television is simply a medium of communication. Its utility to education will depend primarily on how wisely it is used, on the quality of what is communicated, and how television instruction is integrated with other learning experiences in the school.

The Midwest Program on Airborne Television Instruction represents a promising opportunity to harness television to bring the highest quality of education to millions of youngsters, in large and small communities alike, more quickly and at less cost than by any other means available.

Television also can lift many burdens from the classroom teacher and allow the teacher to work more intimately in individual and group learning situations with the students. Used at its full potential, television also may permit salary increases for school faculties as their duties are redefined and more non-professional chores are shifted to assistants and interns.

TV TEACHING IS EFFECTIVE



The effectiveness of television as a powerful medium of school and college instruction now has been clearly established, though much remains to be learned about the best ways of employing this new educational tool.

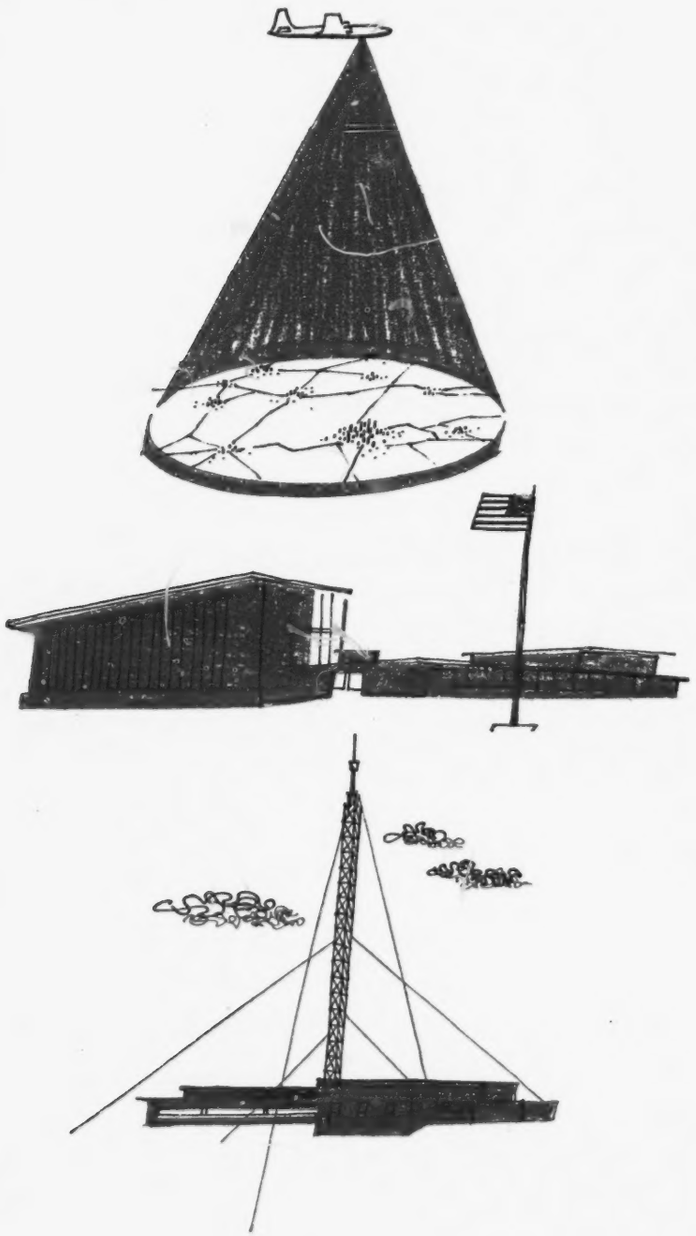
In the 1958-59 school year, 569 public school systems and 117 colleges and universities in America used television for direct instruction in regular courses involving more than 500,000 school children and 100,000 college students.

Despite the sometimes primitive technical conditions and other handicaps under which these early instructional television experiments have operated, the results have been promising. In the bulk of cases, there has been no significant difference between how much students learned by television and how much they learned by conventional instruction.

It now has been demonstrated that television is an effective means for giving far more students access to unusually talented teachers, and for giving students rich learning experiences, such as scientific demonstrations, that cannot possibly be provided in ordinary classrooms.

BUILDING UPON PRESENT SYSTEMS

Educational television stations and closed-circuit TV systems in schools have laid the basis, educationally and technically, for the great stride forward made possible by an airborne system.



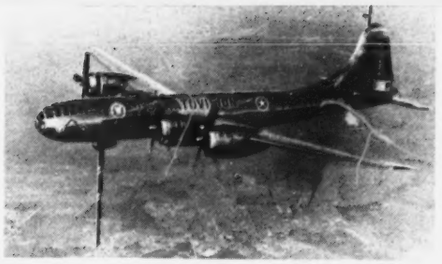
By elevating the "ETV station" a few miles above the earth, its geographic coverage is greatly expanded, enabling it to reach a large majority of school children beyond the telecasting limits of ground-based ETV stations, particularly in small towns and rural areas where educational help is needed most.

On the ground or in the air, however, a single open-circuit channel faces difficulties in attempting to serve a significant portion of the whole curriculum or grade spectrum. A typical 12-grade school system offers anywhere from 100 to 175 separate courses, some divided into differentiated sections according to student ability. A single television channel can provide only 12 half-hour units of instruction in a six-hour school day, enough for only one-half hour per day at each grade level. The disparity between broadcasting potential and size of curriculum is even greater at the college level.

A ground-based, closed-circuit system with six simultaneous channels can overcome this limitation, but the cost is prohibitive when the students to be served are in classrooms which are widely dispersed geographically. Again, this difficulty is overcome when the multi-channel system—starting with two channels and containing the potential for six—becomes airborne.

The single channel, ground-based ETV station and the multi-channel closed circuit system each has its role to play in the full development of instructional television, regionally and nationally. Each adds an element of flexibility to the service provided by a regional airborne system. Different schedules can be followed. Local needs and professional planning more sensitively can strengthen the regional airborne program.

By economically expanding the reach and variety of instructional television, the airborne television system holds promise of making a substantial contribution toward improving the quality of American education.



Modified B-29 was used in original "Stratovision" experiment, demonstrating feasibility of airborne telecasts in 1948.

FEASIBILITY DEMONSTRATED

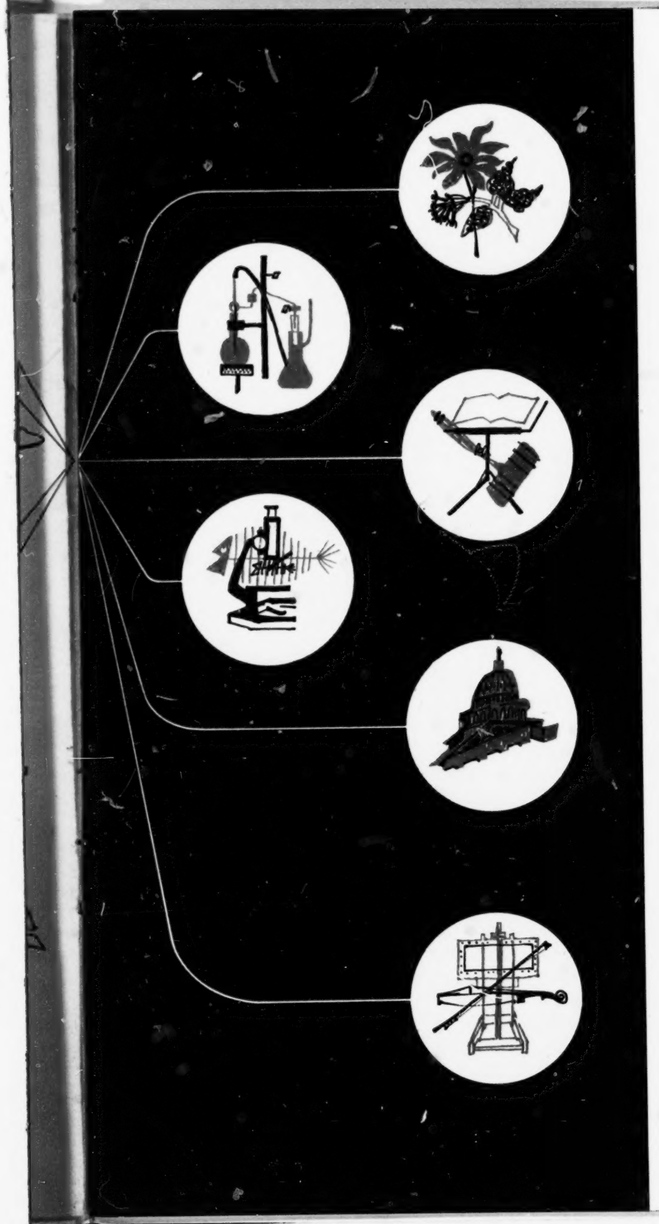
In a three-year experiment soon after World War II, the Westinghouse Electric Corporation developed and demonstrated the technical feasibility of airborne telecasting by delivering a satisfactory signal from an airborne transmitter operating at 25,000 feet to receiving sets as far away as 225 miles, where terrain conditions were favorable.

Recent engineering studies, drawing upon the technical findings of the Westinghouse "Stratovision" experiments, have laid the basis for the Midwest Program to telecast over two channels, and the eventual possibility of as many as six simultaneously from one aircraft. Such a system will enable the telecasting of courses by an outstanding faculty to schools and colleges over most of the territory within a radius of some 150-200 miles. A second stand-by aircraft will assure high reliability of operation regardless of weather conditions and equipment breakdown.

Thus will be made available, at relatively low cost, a top quality faculty and a broad and rich curriculum to a vast number of students both in small rural schools and in large urban schools.

For example, within a radius of 200 miles of north-central Indiana there are more than five million students in over 13,000 separate locations. About one-third of these are in school systems of less than 2,000 pupils which for the most part are too small to provide a satisfactory education under present conditions.

These schools and pupils can be served by the transmitting aircraft except where terrain and similar obstacles cause reception "blindspots," especially on the outer edges of the circle.



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THE PROGRAM'S POTENTIAL

MPATI's schedule will begin initially with the telecasting of instructional programs over two channels. If this pilot operation proves successful, it would then be possible to expand the service to six simultaneous programs.

Eventually, an airborne TV system transmitting six simultaneous programs could provide 72 separate half-hour units during a six-hour school day. This makes it possible to provide high-quality televised programs covering a considerable portion of the entire curriculum of a school system at all grade levels, even allowing for some repetition of programs at different hours to provide greater flexibility of scheduling for individual schools.

In addition, it might be possible to broadcast special programs before and after the regular school day, such as "advanced standing courses" for bright high school students and in-service assistance programs for teachers.

Throughout the experimental period of the project, MPATI will work with educators and lay groups in the six-state region to develop an appropriate form of organization and method of continuing financial support to sustain the program permanently after June, 1962. This, of course, is subject to renewal of channel allocations by the FCC. Such a permanent organization could be created by an interstate educational compact and pooling local and state school resources for the management and finance of the airborne TV program. It might also take the form of a voluntary association of local school districts. Time and study will be required for leaders in the region to determine what form of organization best fits their needs.

If the airborne experiment proves successful, it may serve as a pilot project for similar regional undertakings in other sections of the country. It has been envisioned that eventually a relatively small number of aircraft could provide coast-to-coast educational television coverage.

The system might also have implications for speeding up the educational process in underdeveloped nations by enabling them to jump the illiteracy barrier.

FIRST STAGE AND DEVELOPMENT

FIRST STAGE, 1960-62

The period 1960 through June, 1962 might be considered the first or developmental, stage of the program preceding establishment of a permanent organization for its operation.

During this stage, MPATI will service the participating schools in two phases:

1 FEBRUARY THROUGH MAY 1961.
This will be a period of "demonstration" telecasts, permitting schools to observe the program, to check the quality of signals received and to take steps toward installing and testing their classroom equipment. It is planned that during this period the aircraft will transmit on two VHF channels simultaneously, four hours per day and four days per week.

2 SEPTEMBER 1961 THROUGH MAY 1962.
This phase will constitute the first full academic year of airborne telecast instruction. During this period, present plans call for the aircraft to transmit six hours a day, four days a week. Courses will vary in length from typically 15-20 minutes at the elementary and secondary levels to 30 minutes at the college level.

During both phases of telecasting—but particularly the demonstration period—interested schools will be provided with assistance and guidance on both the technical and educational aspects of the program. The organization for giving such help is described in a later section.

In developing a program of education to be transmitted by television from an aircraft, MPATI has drawn upon a wide array of talent—from curriculum specialists to airplane technicians, from classroom teachers to TV producers. Their particular gifts could be utilized only by a careful organization of the major areas of activity as follows:

SELECTION OF COURSES

The MPATI and the members of its Curriculum Policy and Planning Committee (see Roster of Participants) have held wide consultation with school personnel in the telecast region to assure that the service provided is tailored to the particular needs of schools in the Midwest.

The curriculum committee itself represents an assemblage of outstanding educators from each of the six states encompassed by the program; curriculum experts from all levels of education, elementary through college; men and women thoroughly familiar with and responsible for the school systems of the six-state area.

Their deliberations have produced the tentative schedule of courses shown on pages 12-13. Some modifications will be made in this schedule of courses as the program moves toward the telecasting deadline. The final schedule will be published in a widely circulated bulletin as soon as all arrangements have been completed.

SELECTION OF TV TEACHERS

An intensive "teacher talent search" has been conducted by MPATI to find the most outstanding teachers, not only from the six-state test area, but from classrooms throughout the United States. Kinescoped "auditions" of nearly 300 teacher-candidates already have been forwarded to the viewing rooms at Purdue University where a TV Teacher Preliminary Screening Panel (see Roster of Participants) of local and regional experts in education and educational TV convened to sift out some 50 of the best. These selections, with the addition of some later arrivals, constitute the main "pool" from which a final choice of TV teachers will be made by other panels comprised of eminent scholars, educational TV consultants and other experts in relevant fields.

PRODUCTION OF COURSES

The selected TV teachers will gather at workshops at Purdue University during the summer of 1960 to prepare the courses for airborne TV. This activity will include production of course outlines, development of supplementary written materials, research, design and construction of graphic materials, and consultation with TV production personnel, outstanding academic authorities in particular subject areas, and with curriculum specialists from the six-state region to be sure each course falls within the prescribed "course of study" specifications by the several states.

On completion of course preparation, the TV teachers will go to production centers such as local ETV stations, for the actual recording work.

PRINTED MATERIALS TO SUPPLEMENT TELECASTS

To help them make the maximum use of the telecast courses, participating schools will be provided with a log of courses offered and will be able to purchase needed supplemental texts, syllabi, and other written aids prepared with the assistance of MPATI's Educational Materials Division.

In addition, a manual prepared by prominent educators will be available to teachers and administrators advising them on how to use instructional television effectively in the classroom.

All such material will be carefully tailored to the actual courses to be received on the classroom TV receivers. Appropriate use of and reference to state-adopted texts will be made. There will be full cooperation with commercial publishers of state-adopted and recommended materials. School librarians will be advised in advance of supplemental ma-

MPATI TENTATIVE SCHEDULE OF COURSES

Numbers in parentheses indicate weekly frequency

EST	CST	72 MONDAY 76		72 TUESDAY 76		72 WEDNESDAY 76		72 THURSDAY 76	
9:00	8:00	Russian (4)	Frontiers of Science or Math (3)	Russian (4)	Mathematics for Teachers H.S.	Russian (4)	Frontiers of Science or Math (3)	Russian (4)	Frontiers of Science or Math (3)
9:30	8:30	General Science Junior High (4)	Physics MIT (4)	General Science Junior High (4)	Physics MIT (4)	General Science Junior High (4)	Physics MIT (4)	General Science Junior High (4)	Physics MIT (4)
10:00	9:00	Arithmetic Grade 3 (2)	Arithmetic Grade 6 (2)	Arithmetic Grade 4 (2)	Arithmetic Grade 5 (2)	Arithmetic Grade 3 (2)	Arithmetic Grade 6 (2)	Arithmetic Grade 4 (2)	Arithmetic Grade 5 (2)
10:15	9:15	French or Spanish 1 Junior High (4)	Advanced Foreign Language H.S. (4)	French or Spanish 1 Junior High (4)	Advanced Foreign Language H.S. (4)	French or Spanish 1 Junior High (4)	Advanced Foreign Language H.S. (4)	French or Spanish 1 Junior High (4)	Advanced Foreign Language H.S. (4)
10:45	9:45	Music Grades 1-3 (2)	Music Grades 4-6 (2)	Art Grades 1-3 (2)	Art Grades 4-6 (2)	Music Grades 1-3 (2)	Music Grades 4-6 (2)	Art Grades 1-3 (2)	Art Grades 4-6 (2)
11:00	10:00	Humanities (3)	Int. Relations Area Study (4)	Humanities (3)	Int. Relations Area Study (4)	Guidance Senior High (1)	Int. Relations Area Study (4)	Humanities (3)	Int. Relations Area Study (4)
11:30	10:30	Social Studies Grades 1-3 (2)	Arithmetic Gifted Children (2)	Language Arts Grades 1-2 (2)	Teachers' French	Social Studies Grades 1-3 (2)	Arithmetic Gifted Children (2)	Language Arts Grades 1-2 (2)	Teachers' Spanish
11:45	10:45	Language Arts Grades 3-4 (4)	Language Arts Grades 5-6 (4)	Language Arts Grades 3-4 (4)	Language Arts Grades 5-6 (4)	Language Arts Grades 3-4 (4)	Language Arts Grades 5-6 (4)	Language Arts Grades 3-4 (4)	Language Arts Grades 5-6 (4)
12:00	11:00	Humanities (3) repeat	Frontiers of Science or Math repeat (3)	Guidance Junior High (1)	Frontiers of Science or Math repeat (3)	Humanities (3) repeat	Guidance Senior High (1) repeat	Humanities (3) repeat	Frontiers of Science or Math repeat (3)
12:30	11:30	Government—Civics Grades 8-12 (4)	Int. Relations Area Study repeat (4)	Government—Civics Grades 8-12 (4)	Int. Relations Area Study repeat (4)	Government—Civics Grades 8-12 (4)	Int. Relations Area Study repeat (4)	Government—Civics Grades 8-12 (4)	Int. Relations Area Study repeat (4)
1:00	12:00	Science Continental Classroom (5)	Great Issues Social Science (3)	Science Continental Classroom (5)	Great Issues Social Science (3)	Science Continental Classroom (5)	Mathematics for Teachers H.S. repeat (1)	Great Issues Social Science (3)	Science Continental Classroom (5)
1:30	12:30	General Science Junior High repeat (4)	Humanities Great Books (2)	General Science Junior High repeat (4)	Guidance Junior High repeat (1)	General Science Junior High repeat (4)	Humanities Great Books (2)	General Science Junior High repeat (4)	Science Continental Classroom (5)
2:00	1:00	Art Grades 1-3 repeat (2)	Art Grades 4-6 repeat (2)	Music Grades 1-3 repeat (2)	Music Grades 4-6 repeat (2)	Art Grades 1-3 repeat (2)	Art Grades 4-6 repeat (2)	Music Grades 1-3 repeat (2)	Music Grades 4-6 repeat (2)
2:15	1:15	Science Grades 1-2 (2)	Social Studies Grades 4-6 (4)	Arithmetic Gifted Children repeat (2)	Social Studies Grades 4-6 (4)	Science Grades 1-2 (2)	Social Studies Grades 4-6 (4)	Arithmetic Gifted Children repeat (2)	Social Studies Grades 4-6 (4)
2:30	1:30	French Grades 3-6 (4)	Spanish Grades 3-6 (4)	French Grades 3-6 (4)	Spanish Grades 3-6 (4)	French Grades 3-6 (4)	Spanish Grades 3-6 (4)	French Grades 3-6 (4)	Spanish Grades 3-6 (4)
2:45	1:45	Science Grades 3-4 (4)	Science Grades 5-6 (4)	Science Grades 3-4 (4)	Science Grades 5-6 (4)	Science Grades 3-4 (4)	Science Grades 5-6 (4)	Science Grades 3-4 (4)	Science Grades 5-6 (4)
3:00	2:00								

terials mentioned in the TV courses so that they may have an adequate supply on hand.

OPERATION OF AIRCRAFT

Two DC6AB aircraft—one to serve as a standby—will be used for transmitting study courses to the schools. Based at Purdue University Airport, West Lafayette, Indiana, each plane will be equipped with two TV transmitters and external 30-foot sending antenna, permitting telecasting of two courses of instruction simultaneously.

In operation during the school day, the transmitting aircraft will orbit in a circle of 10 miles radius at an assigned altitude of 23,000 feet over north central Indiana, with the community of Montpelier as the approximate center. The Federal Aviation Agency has assisted in the selection of this airspace to insure uninterrupted operation of the planes.

The Federal Communications Commission has granted limited experimental authorization, subject to stated conditions, to use the needed telecasting channels, both for the air-to-ground transmission and a ground-to-air link. The latter will not be used at the outset, but may be activated later to beam "live" courses via the aircraft from studios at Purdue University some 85 miles to the west.

Air-to-ground transmission will be on standard-band, ultra high frequency channels. MPATI also will experiment with narrow-band (3 megacycle instead of 6 megacycle) UHF transmission which ultimately could permit a doubling of the number of programs transmitted.

Over-all responsibility for engineering the airborne telecasting system is being carried by Westinghouse Electric Corporation, and responsibility for the narrow-band aspects of the program by CBS Laboratories, Inc.

In addition to school systems which will be receiving the courses directly, local educational television stations in major cities in the area will be encouraged to pick them up for re-telecasting to "fringe" areas of reception or video tape them for telecasting to schools or homes at hours different from the airborne telecast schedule.

During the first stage of this program, Purdue University and the Purdue Research Foundation are providing the legal, fiscal, and physical facilities for the development of the program. The Midwest Council on Airborne Television Instruction operates as an independent policy-making and management group, using the legal and fiscal facilities of the university and its foundation. The vision and understanding of the Purdue officials in a large measure make the practical development of the program possible.

AREA RESOURCES FOR PARTICIPATING SCHOOLS

Colleges and universities will serve as resource institutions within the six-state telecasting region for schools and school personnel interested in participating in the Midwest Program on Airborne Television Instruction.

Each of these cooperating institutions (see preliminary list below) traditionally has served its respective geographic area as a resource to the schools, teachers and administrators of educational systems in that area.

Headquartered at each institution will be an assigned MPATI Area Coordinator and an Area Committee consisting of school and university educators and administrators, ETV representatives and lay leaders in civic, professional and other groups in the area. Two members of each Area Committee also will serve on a Regional Advisory Council to help coordinate the entire six-state program.

PRELIMINARY LIST OF RESOURCE INSTITUTIONS located by number on map, page 16

ILLINOIS
1 Northern Illinois University, DeKalb
2 Northwestern University, Evanston
3 University of Illinois, Urbana

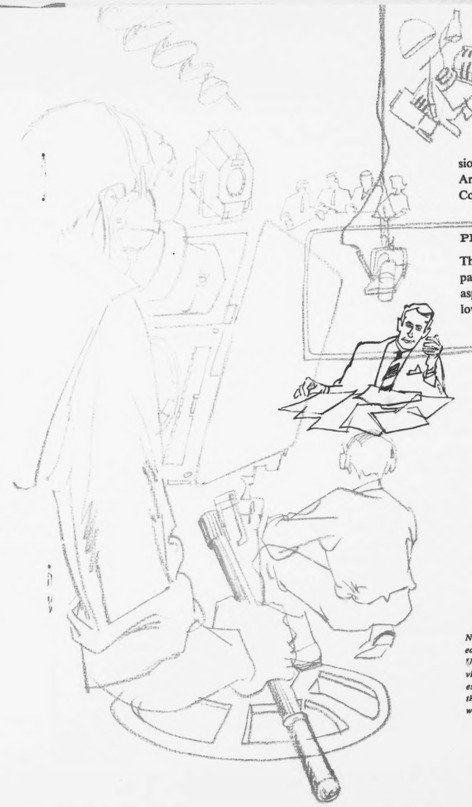
INDIANA
4 Ball State Teachers College, Muncie
5 Butler University, Indianapolis
6 Indiana State Teachers College, Terre Haute
7 Indiana University, Bloomington
8 Notre Dame University, South Bend
9 Purdue University, West Lafayette

KENTUCKY
10 University of Kentucky, Lexington
11 University of Louisville, Louisville

MICHIGAN
12 Michigan State University, East Lansing
13 Wayne State University, Detroit
14 Western Michigan University, Kalamazoo

OHIO
15 Bowling Green State University, Bowling Green
16 Miami University, Oxford
17 Ohio State University, Columbus

WISCONSIN
18 University of Wisconsin at Milwaukee



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PROFESSIONAL AND TECHNICAL AID

The Area Committees will be prepared to assist MPATI participating schools in all the professional and technical aspects of the program. Briefly, they will perform the following functions:

Act as liaison between MPATI and colleges and local schools participating in the program.

Assist in distribution of information about the program through printed materials and public meetings.

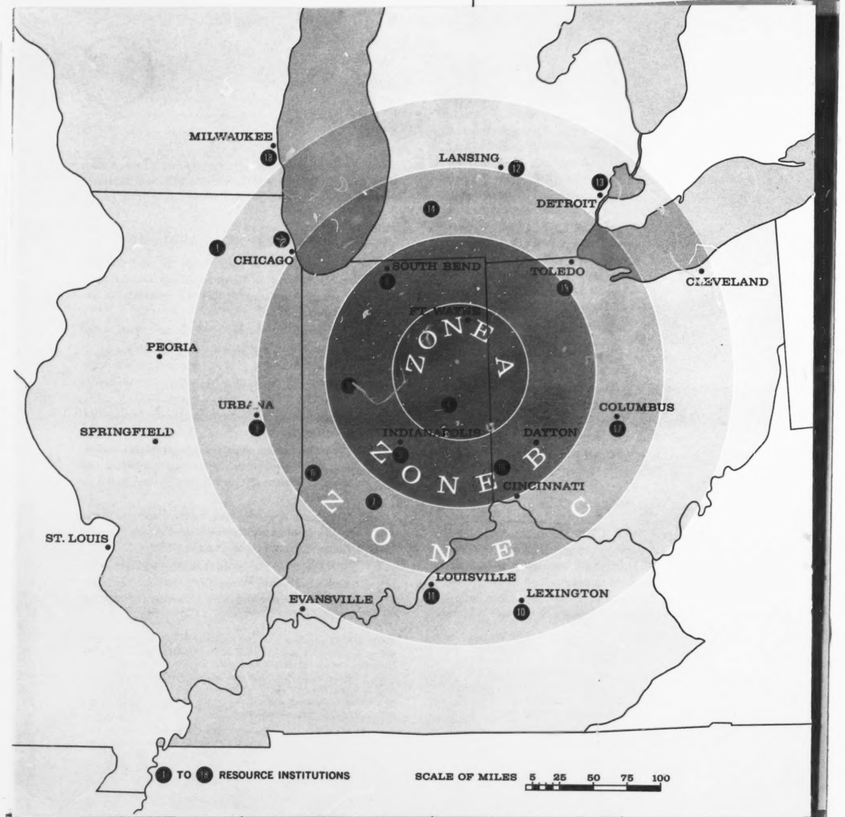
Arrange for evaluation of airborne telecasts received in the area.

Make available to participating schools information on classroom reception equipment, kinds and costs of equipment needed, and special problems of installation.

Arrange in-service training for classroom teachers and others seeking assistance on how best to utilize the airborne telecasts.

Arrange workshops and seminars for school personnel in the area to acquaint them with the potentialities and techniques of classroom educational television.

NOTE: MPATI workshops have been scheduled for the summer of 1960 at each of the resource institutions listed on the preceding page, plus De Paul University, Chicago. These will be designed for classroom teachers, supervisors, school superintendents, principals and other school personnel interested in making the best use of the medium of educational television and the airborne instructional program. For specific dates of workshops please write to MPATI at Purdue University.



SPECIAL INFORMATION FOR THE SCHOOLS

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EQUIPMENT CONSIDERATIONS

The following information is designed to give schools an idea of the kinds of equipment needed and approximate costs. Costs will vary according to the quality and complexity of the equipment required. The most variable factor, however, is the antenna system:—as a general rule, the farther away the school from the center of the telecasting circle, the more expensive is the antenna required; hilly terrain or tall buildings also will affect this installation, particularly in the outer areas.

Careful consideration should be given to the quality of the receiving system because the effectiveness of TV instruction is strongly affected by the clarity and reliability of both the sound and picture received in the classroom. A little additional money spent on better quality equipment at the outset can pay significant educational and financial dividends.

The map on the opposite page has been divided into Zones A, B, and C, representing distances from the airborne transmitters of 0 to 50 miles, 50 to 100 miles, and 100 to 150 miles, respectively. Actually, no such fine-line distinction exists between zones, but the designations are helpful in estimating reception characteristics and equipment needed. With proper equipment a satisfactory signal may be expected at most locations in all three zones. On the fringes of or beyond Zone C, however, the probabilities of good reception decline. Schools in these and other problem areas, upon indicating interest in participating, will be alerted by MPATI's technical staff if it appears they will need special assistance in antenna installation.

Schools may select one of two installations—(1) a system of master antenna with central UHF converter, amplifier and distribution lines linked to a series of VHF classroom receivers, or (2) individual antennas connected directly into UHF/VHF receivers. (Technically, it is not feasible to distribute a UHF signal from a single antenna to more than one receiver.)

The latter installation, although more economical when a small number of receivers is installed, has certain disadvantages: The appearance of individual antennas on the roof of a school building may be unattractive, particularly as the number of receivers increases. Also, there is no control point to assure consistently good reception on all sets. Perhaps most important of all, while the system installation can serve as a nucleus for a closed-circuit system within the school at a later time, the individual antenna installation would not be easily adaptable to this purpose.

The two systems are diagrammed on the opposite page.

HOW SCHOOLS AND COLLEGES CAN PARTICIPATE

Courses are being programmed for telecasting roughly in the ratio of 40 per cent each for elementary and secondary levels and 20 per cent for college and university.

Participation by schools at all levels is on a voluntary basis, as is the number and nature of courses they wish to select from the telecast offerings, and the number of classrooms they wish to equip.

Participating schools will equip themselves at their own expense. Approximate costs can be derived from the information on the following pages. After an assessment based on this information, if schools wish to express a preliminary interest in participating, they are urged to fill out and mail to MPATI the attached reply card.

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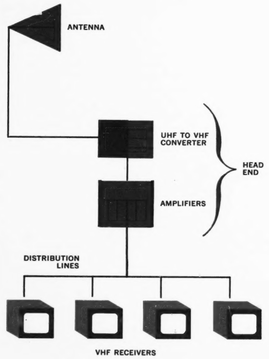
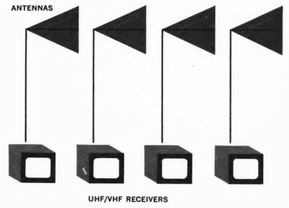
ALTERNATIVE INSTALLATIONS

(1) SYSTEM INSTALLATION



(2) INDIVIDUAL ANTENNA INSTALLATION



ESTIMATED MEDIAN COST PER ROOM

To estimate total costs of equipment and installation from the chart, find what zone your school is in, move across to the column representing the number of rooms you may wish to equip, select the dollar figure on the line that indicates which system you will install. This figure is your estimated cost per room. Multiply it by the number of rooms you will equip to get the total cost. For example, if your school is in Zone B and you wish to equip five rooms with the system installation, the total cost estimate (5 x $497) is $2,485.

ZONE A

ZONE B

ZONE C

SAMPLE EQUIPMENT COSTS

TV RECEIVER WITH STAND

Schools may select simple, minimum standard receivers, quite similar to those used in many homes, or they may wish specially built sets with certain safety, durability, control and other features.

Minimum Standards Set	$150–$200
Special School Standards Set	$250–$350

ANTENNA AND INSTALLATION

Antennas will vary in cost depending on their size and complexity, which in turn depends on distance from the aircraft and local terrain conditions. (See map)

Zone A	$50–$100
Zone B	$100–$200
Zone C	$200–$1000

HEAD END INCLUDING INSTALLATION

This applies to the system installation only. Costs are estimated to cover two channels.

UHF Converter	Approx. $600
Amplifiers	$300–$500

DISTRIBUTION (WIRING TO ROOMS)

With system or individual antenna installation.

Per Room	$50

	2 Rooms	5 Rooms	10 Rooms	20 Rooms	40 Rooms
System Installation	$760	$430	$332	$278	$252
Individual Antenna	$320	$320	$320	$320	$320
System Installation	$800	$497	$340	$282	$254
Individual Antenna	$395	$395	$395	$395	$395
System Installation	$925	$505	$365	$295	$260
Individual Antenna	$645	$645	$645	$645	$645

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SAMPLE EQUIPMENT COSTS

Readers are cautioned that cost figures presented in the chart at the left do not constitute a "price list," but are merely approximations based on current information supplied by major manufacturers of such equipment. Installation costs, too, will vary according to individual school building conditions and the local labor market.

COST PER ROOM EQUIPPED

In the system installation, the principal variable in equipping a number of rooms lies in the antenna and its location (see map page 16). Costs per room remain constant in the individual antenna installation. In the chart at the left, cost estimates again are approximate, based on the ranges in sample equipment costs listed above.

FINANCING

Schools may want to investigate the possibility of financing equipment and installation on an installment or deferred payment basis. Equipment manufacturers and their local dealers are prepared to offer a variety of arrangements for financing on a short or long-term basis. A rental arrangement might also be considered. Service contracts or similar agreements might also be desirable for maintenance of the receiving systems.

SOME QUESTIONS AND ANSWERS

Q. What is the best ratio of receivers to students?

A. The usual ratio is 20 to 30 students per set.

Q. How many receiving sets are needed for each classroom?

A. One set is adequate for an average size room, although some schools find advantage in using two. A spare set is frequently kept on hand as a precaution against set failure, usually in the ratio of one spare set per 10 sets in use.

Q. Would it be better to equip a large room with several receivers instead of single receivers in each classroom?

A. Not unless you wish to have large classes of 75, 100 or more. Some schools have found it advantageous in certain courses to have such large sessions, followed by smaller discussion sections.

Q. Are standard receiving sets, like the one I have in my home, suitable for classroom use?

A. Yes, if the screen is not less than 21" and the speaker is in the front of the set. Also, it is best if controls are not on the top of the set since, when elevated, they may be difficult to reach.

Q. What is the best way to mount the receiver sets?

A. Stands of aluminum tubing are most frequently used. It is best if they are adjustable in height. Be sure the base is broad enough to avoid top-heaviness.

Q. Should the mounts be on rollers?

A. A permanently mounted set saves mechanical wear and tear. However, it may be necessary to have rollers on some of the mountings to move them into position. Large rollers are desirable to prevent "tripping."

Q. How high should sets be mounted?

A. At whatever level is most comfortable for the students. Many schools mount the sets so that the center of the screen is about 5½ feet from the floor.

Q. What about the problem of glare?

A. Although sets can be angled to minimize this problem, it is important to work on the source of the trouble. It may be necessary to use spun-glass or other type curtains to shut out direct light. Homemade shields are sometimes used over the top of the sets to eliminate overhead glare.

Q. What are some of the special features that might be considered in purchasing receiver sets?

A. You may want to consider such factors as electrically grounding the sets, minimum reflection (some of the new sets have fewer layers of glass across the front and have thus reduced the reflecting surfaces), lockable controls (to discourage tampering), volume output and control, ease of repair, and implosion effect (if an object shatters the vacuum tube).

Q. Are students likely to tamper with the sets?

A. One large school closed-circuit TV system reports that less than one per cent of its receiver difficulties stems from this source.

Q. Could we use ordinary indoor antennas?

A. No, these will not produce a satisfactory signal.

Q. How should rooms be lighted?

A. No special lighting is necessary. Rooms should be illuminated enough so that students can take notes.

Q. How about acoustics?

A. The acoustics problem is the same as in an ordinary non-TV classroom.

Q. How long will sets last?

A. A quality set should work satisfactorily for at least 3 to 5 years or more with regular maintenance.

Q. Does it really matter which make or model we buy?

A. Yes. For reliability and service it is important to deal with a reputable firm.

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Educational Services Division

Director: Herman L. Shibler
Associate Director: Wayne P Watson

Educational Materials Division

Director: To be appointed
Associate Director: Ben A. Bohnhorst
Project Manager: Robert Rippen

Engineering and Aeronautical Services Division

Director: A. Earl Cullum, Jr.
Associate Director: Thomas A. Wright, Jr.
Project Managers: Grove Webster and James S. Miles

Program Distribution Division

Director: To be appointed

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